NTSB National Transportation Safety Board

Office of Aviation Safety

Public Hearing
Pinnacle Airlines Flight 3701
(DCA05MA003)

Lorenda Ward

Investigator-in-Charge

Accident Summary

- October 14, 2004
- Pinnacle Airlines
- Bombardier CL-600 2B19
- Repositioning flight
- Two flight crewmembers killed

Takeoff to 15,000 Feet

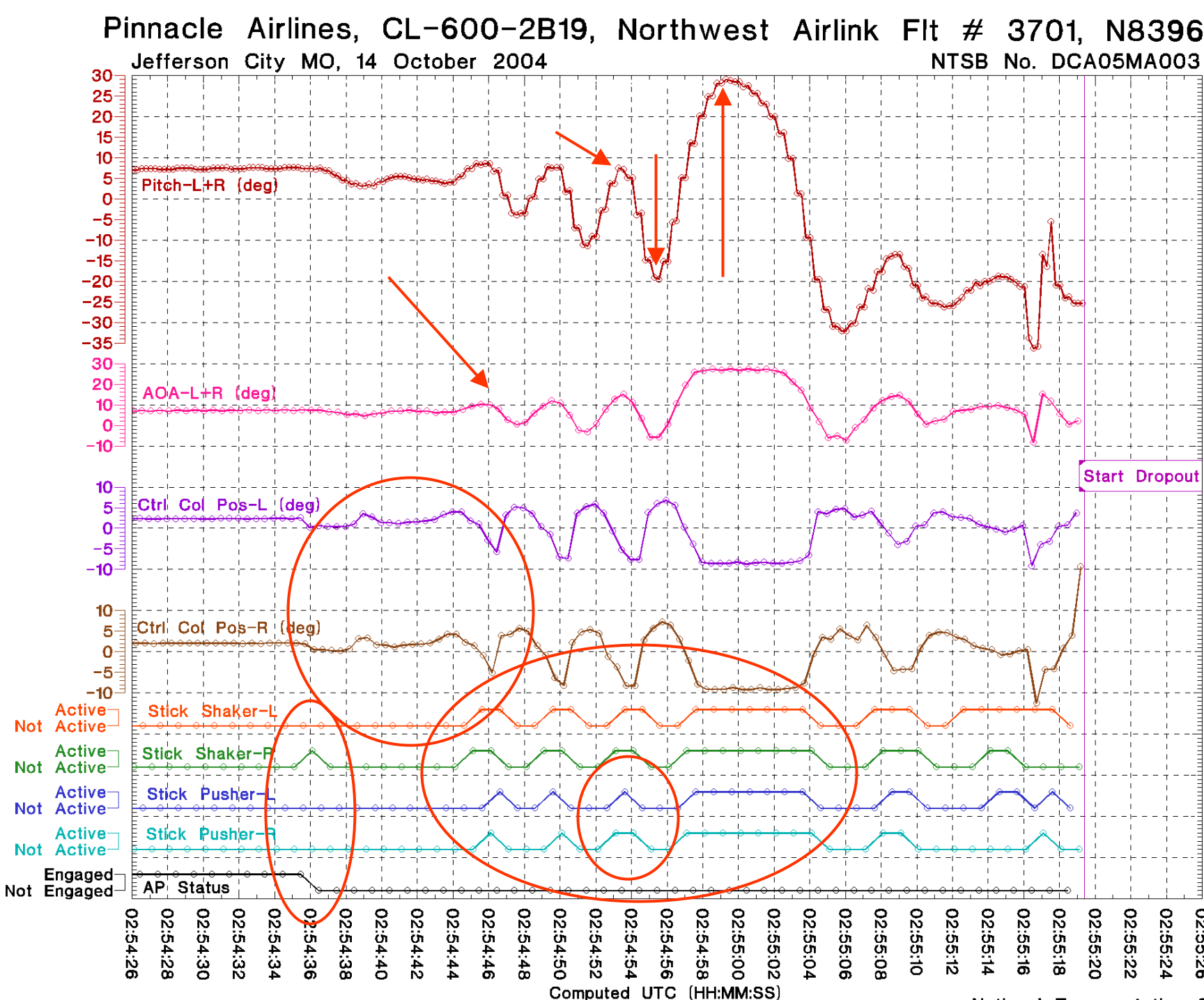
- Dispatched to 33,000 feet
- Stall protection system activated
- Autopilot engaged
- Flight crew changed seats

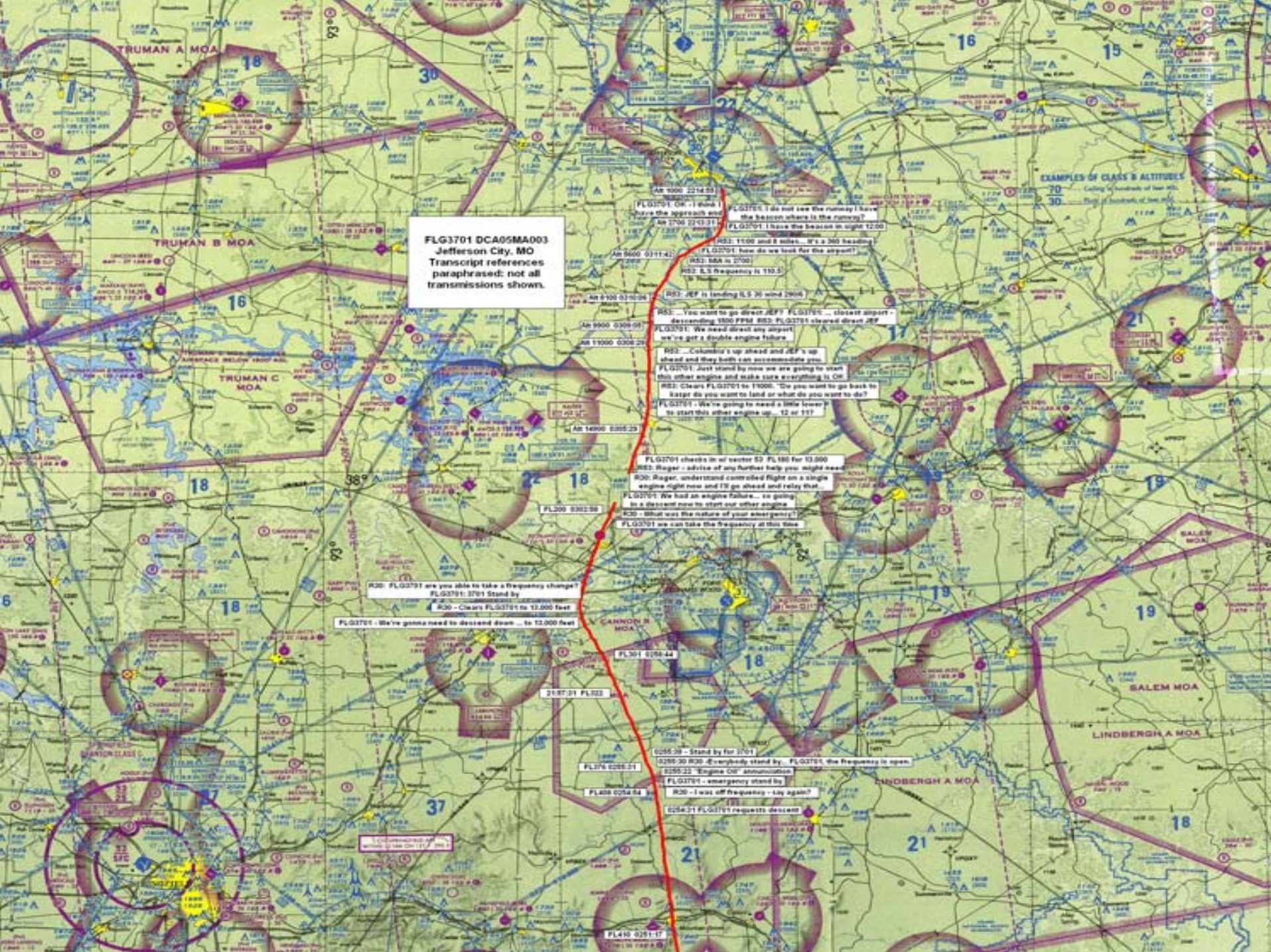
15,000 Feet to 25,000 Feet

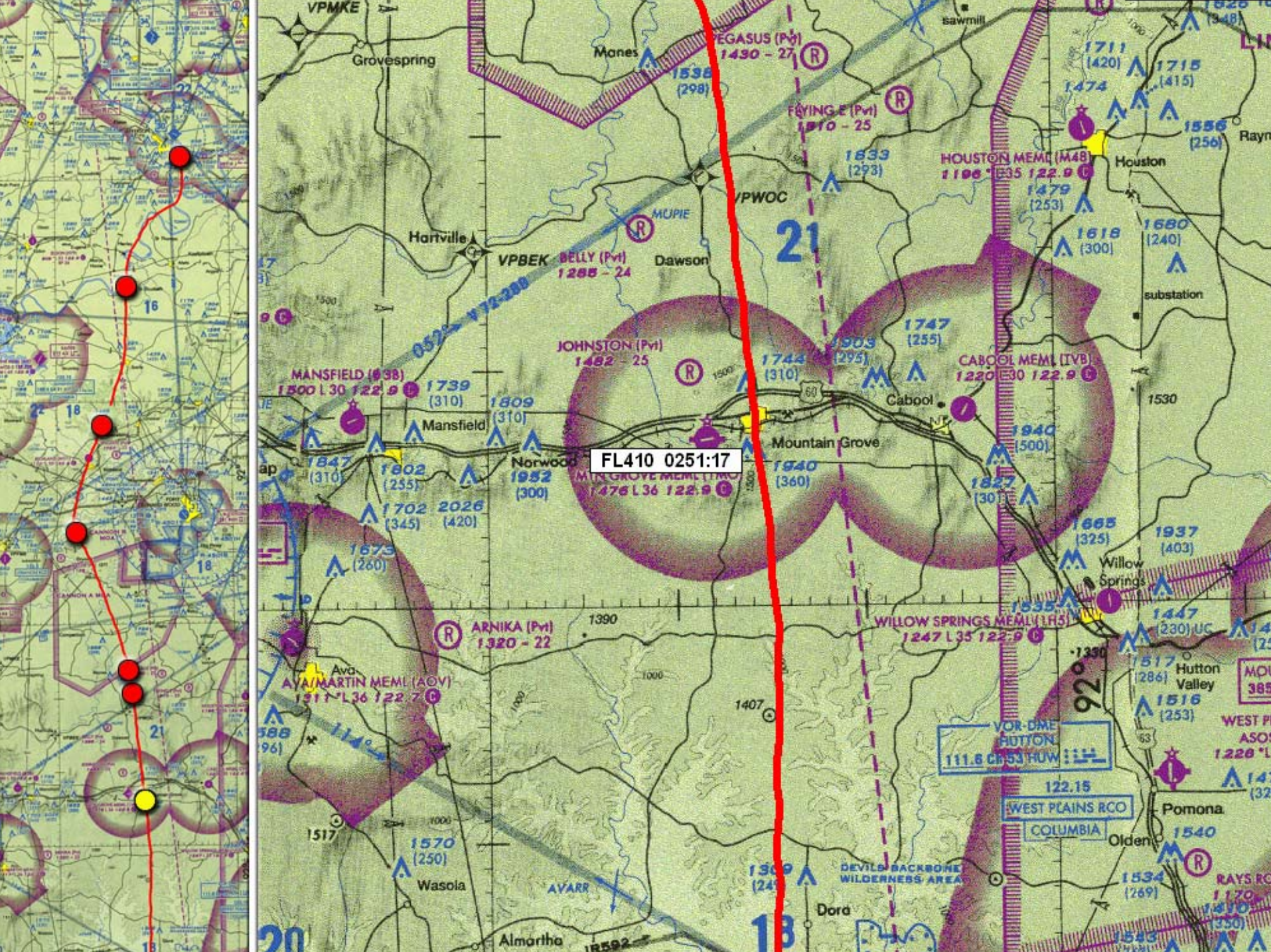
- Autopilot disengaged
- Airplane leveled off
- Elevator and rudder inputs made
- Autopilot engaged

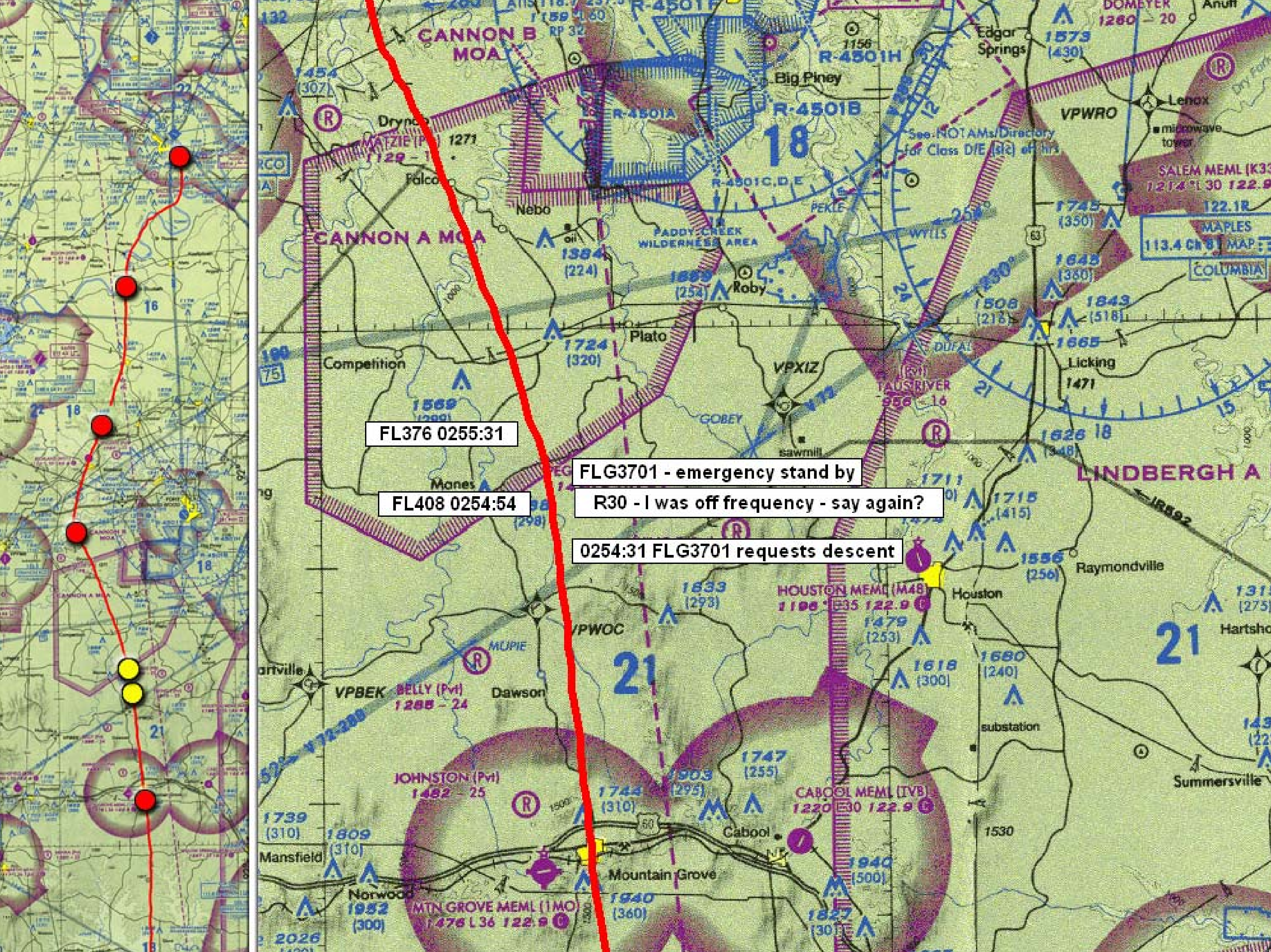
25,000 Feet to 41,000 Feet

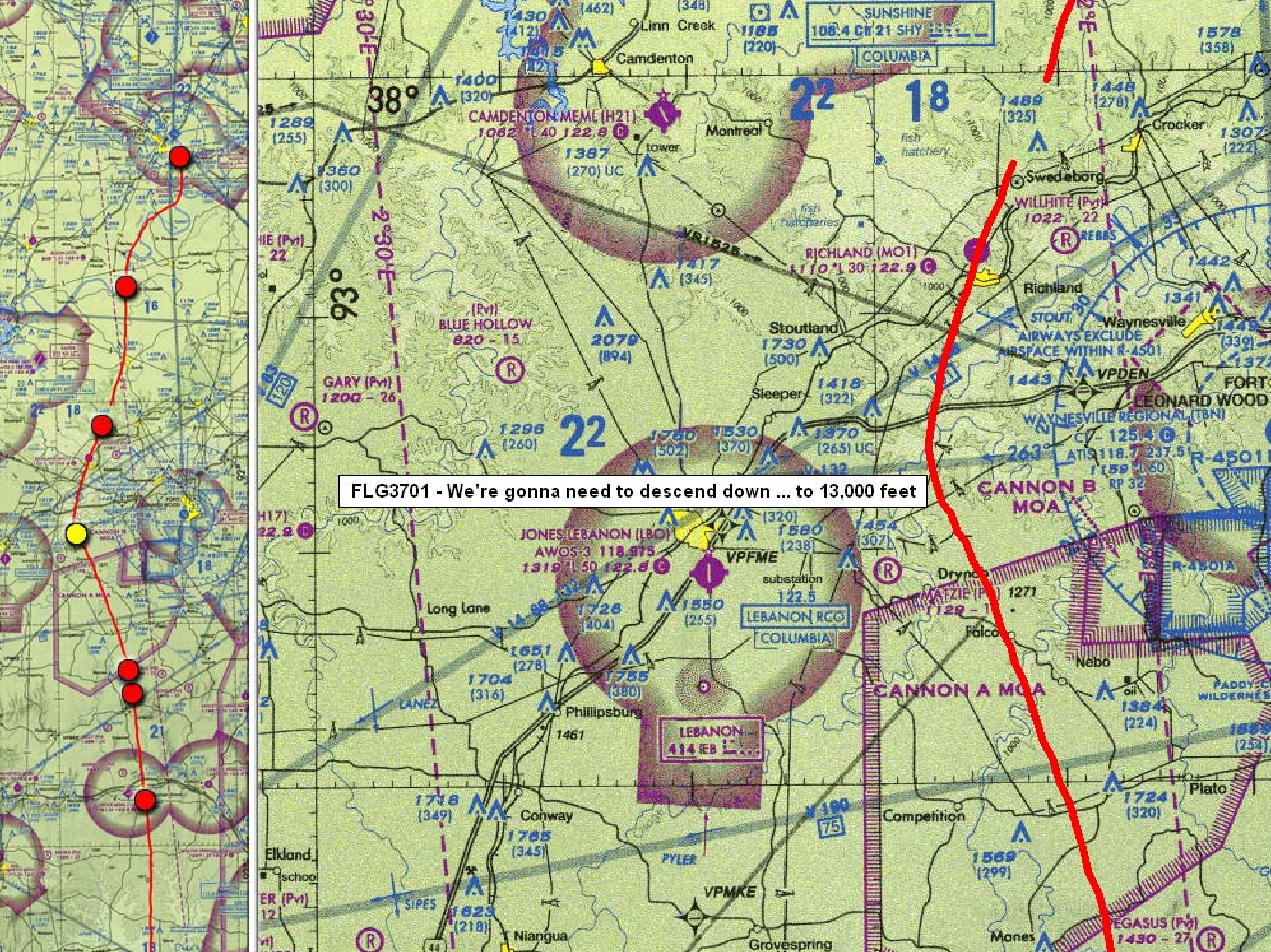
- Autopilot disengaged
- Elevator inputs made
- Autopilot engaged
- Vertical speed changed
- Flight crew requested and received clearance to 41,000 feet
- Airplane climbed at 500 feet per minute


Pinnacle Airlines, CL-600-2B19, Northwest Airlink Flt # 3701, N8396A
Jefferson City MO, 14 October 2004
NTSB No. DCA05MA003
Pitch-L+R (deg)
AOA-L+R (deg)
Start Dropout
Ctrl Col Pos-L (deg)
Ctrl Col Pos-R (deg)
Active
Not Active
Stick Shaker-L
Stick Shaker-R
Stick Pusher-L
Stick Pusher-R
Engaged
Not Engaged
AP Status
Computed UTC (HH:MM:SS)

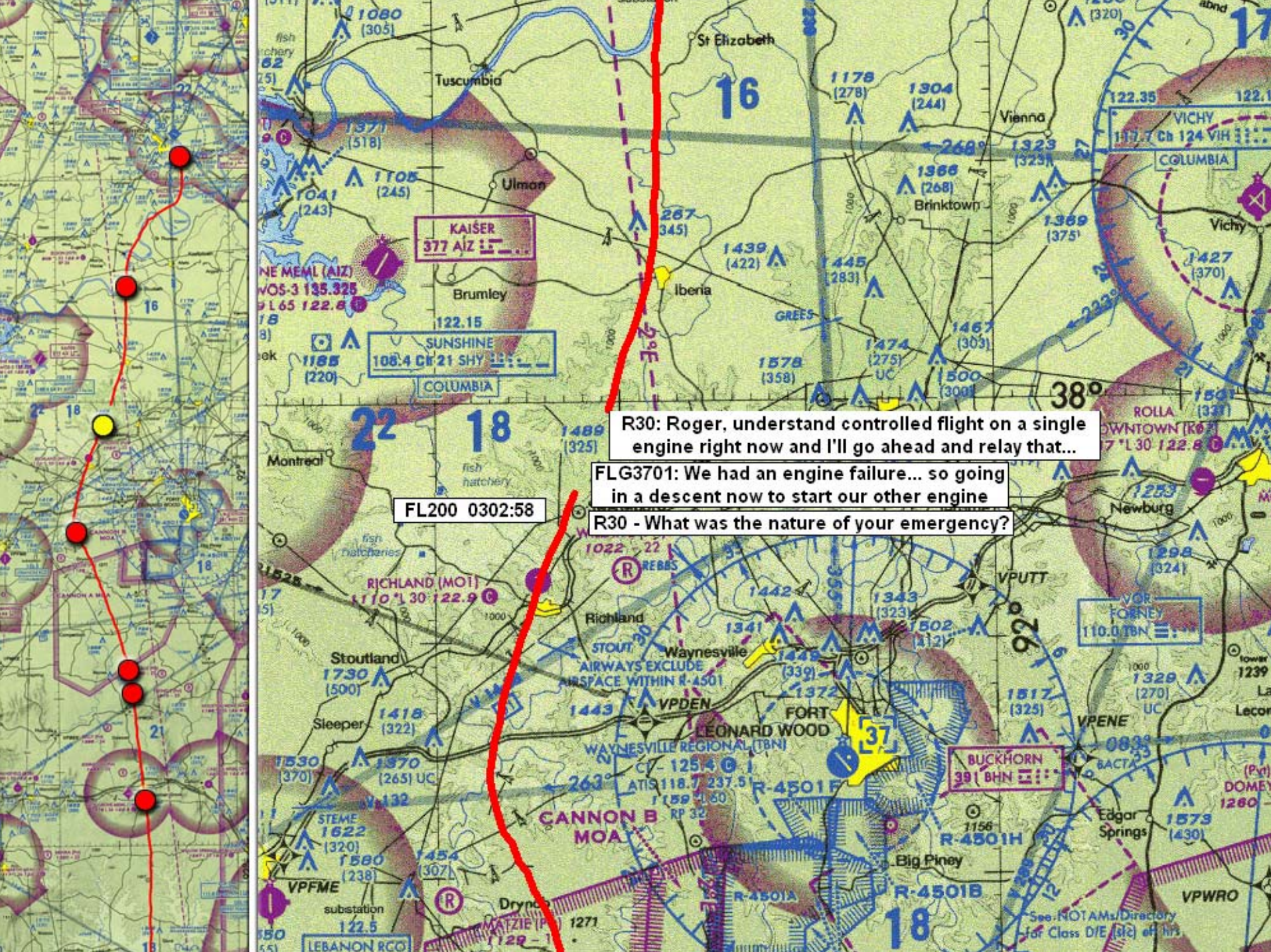

FLG3701 DCA05MA003
Jefferson City, MO
Transcript references paraphrased: not all transmissions shown.
TRUMAN A MOA
TRUMAN B MOA
TRUMAN C MOA
CANNON B MOA
SALEM MOA
LINDBERGH A MOA
EXAMPLES OF CLASS B ALTITUDES
FLG3701: I do not see the runway I have the beacon where is the runway?
FLG3701: I have the beacon in sight 12:00
FLG3701: how do we look for the airport?
FLG3701: We need direct any airport we've got a double engine failure.
R53: ...Columbia's up ahead and JEF's up ahead and they both can accommodate you.
FLG3701: Just stand by now we are going to start this other engine and make sure everything is OK
R53: Clears FLG3701 to 11000. "Do you want to go back to Kaspr do you want to land or what do you want to do?
FLG3701 - We're going to need a little lower to start this other engine up... 12 or 11?
FLG3701 checks in w/ sector 53 FL180 for 13,000
R53: Roger - advise of any further help you might need
R30: Roger, understand controlled flight on a single engine right now and I'll go ahead and relay that..
FLG3701: We had an engine failure... to going to a descent now to start our other engine
R30 - What was the nature of your emergency?
FLG3701 we can take the frequency at this time
R30: FLG3701 are you able to take a frequency change?
FLG3701: 3701 Stand by
R30 - Clears FLG3701 to 13,000 feet
FLG3701 - We're gonna need to descend down ... to 13,000 feet
0255:39 - Stand by for 3701
0255:30 R30 -Everybody stand by... FLG3701, the frequency is open.
0255:22 "Engine Oil" annunciation
FLG3701 - emergency stand by
R30 - I was off frequency - say again?
0254:31 FLG3701 requests descent


FL410 0251:17
VPMKE
Grovespring
Manes
PEGASUS (Pvt)
1430 - 27
1538
(298)
sawmill
1711
(420)
1715
(415)
1474
1556
(256)
Houston
FLYING E (Pvt)
1910 - 25
1833
(293)
HOUSTON MEML (M48)
1196 L35 122.9
1479
(253)
VPWOC
21
MUPIE
Hartville
VPBEK
BELLY (Pvt)
1285 - 24
Dawson
1618
(300)
1680
(240)
substation
057° - 237°
JOHNSTON (Pvt)
1482 - 25
1747
(255)
1744
(310)
1903
(295)
CABOOL MEML (IVB)
1220 E30 122.9
MANSFIELD (6B)
1500 L30 122.9
1739
(310)
1609
(310)
Cabool
1530
Mansfield
1940
(500)
Mountain Grove
1847
(310)
1602
(255)
Norwood
1952
(300)
MTN GROVE MEML (TMO)
1476 L36 122.9
1940
(360)
1827
(301)
1702
(345)
2026
(420)
1665
(325)
1937
(403)
1673
(260)
Willow Springs
ARNIKA (Pvt)
1320 - 22
1390
WILLOW SPRINGS MEML (LH5)
1247 L35 122.9
1535
1447
(230) UC
1517
(286)
Hutton Valley
AVA/MARTIN MEML (AOV)
1311 L36 122.7
Ava
1407
1516
(253)
VOR-DME
HUTTON
111.6 CRS 53 HUW
122.15
WEST PLAINS RCO
COLUMBIA
Pomona
Olden
1517
1570
(250)
Wasola
AVARR
DEVILS BACKBONE WILDERNESS AREA
1534
(269)
Dora
Almartha
16
18
21
20
92°
114°


FL376 0255:31
FL408 0254:54
FLG3701 - emergency stand by
R30 - I was off frequency - say again?
0254:31 FLG3701 requests descent
CANNON B MOA
CANNON A MOA
R-4501H
R-4501B
R-4501A
R-4501C,D,E
Big Piney
Edgar Springs
Lenox
VPWRO
SALEM MEML
MAPLES
COLUMBIA
Drynob
Falcon
Nebo
PADDY CREEK WILDERNESS AREA
Roby
Plato
Competition
VPXIZ
Licking
Manes
LINDBERGH A
HOUSTON MEML (M48)
Houston
Raymondville
VPWOC
MUPIE
Dawson
VPBEK
BELLY (Pvt)
Hartshorn
substation
Summersville
JOHNSTON (Pvt)
CABOOL MEML (TVB)
Cabool
Mansfield
Norwood
Mountain Grove
MTN GROVE MEML (1MO)



FLG3701 - We're gonna need to descend down ... to 13,000 feet
Linn Creek
Camdenton
SUNSHINE
COLUMBIA
CAMDENTON MEML (H21)
Montreal
Crocker
Swedeborg
RICHLAND (MO1)
Richland
BLUE HOLLOW
Stoutland
Waynesville
GARY (Pvt)
Sleeper
LEONARD WOOD
WAYNESVILLE REGIONAL (TBN)
CANNON B MOA
JONES LEBANON (LBO)
VPFME
Long Lane
LEBANON RCO
Phillipsburg
CANNON A MOA
LEBANON
Conway
Competition
Plato
Elkland
PYLER
VPMKE
Niangua
Grovespring
Mones
PEGASUS (Pvt)


R30: Roger, understand controlled flight on a single engine right now and I'll go ahead and relay that...
FLG3701: We had an engine failure... so going in a descent now to start our other engine
FL200 0302:58
R30 - What was the nature of your emergency?
Tuscumbia
St Elizabeth
Ulmon
Brumley
Iberia
Vienna
Brinktown
Vichy
Montreal
Richland
Waynesville
Stoutland
Sleeper
Newburg
Edgar Springs
Big Piney
Drynob
CANNON B MOA
R-4501F
R-4501H
R-4501A
R-4501B
FORT LEONARD WOOD
WAYNESVILLE REGIONAL (TBN)
KAISER 377 AIZ
SUNSHINE 108.4 CH 21 SHY
COLUMBIA
RICHLAND (MO1)
VICHY
VPDEN
VPUTT
VPENE
VPWRO
VPFME
BUCKHORN 391 BHN
VOR FORNEY 110.0 TBN
LEBANON RCO
STOUT AIRWAYS EXCLUDE AIRSPACE WITHIN R-4501
See NOTAMs/Directory for Class D/E (sfc) of hrs

Double Engine Failure (Cont)

Relight using windmilling:

From 21,000 feet and below:
Attempt to start both engines at the same time.

1. CONT IGNITION ..... CHECK ON
2. Airspeed ..... NOT LESS THAN 300 KIAS

An altitude loss of approximately 5,000 feet can be expected when accelerating from 240 to 300 KIAS.

NOTE

Airplanes 7002 through 7304—With the ADG deployed, during a windmilling start, an airspeed of 330 knots is permitted for 12 minutes, or an airspeed of 335 knots is permitted for 4 minutes.

Airplanes 7305 and subsequent—There are no airspeed limitations with the ADG deployed during flight.

When ITT is 90°C or less and N_2 is:

- **At least 12% (above 15,000 feet) or**
- **At least 9% (15,000 feet and below):**

3. Thrust Levers (both) ..... IDLE
4. Airspeed ..... NOT LESS THAN 300 KIAS

   Maintain airspeed until start is complete (stable idle).
5. Engine Indications ..... MONITOR

Windmilling relight possible (requires airspeed of not less than 300 KIAS):

? — **YES**

(From 21,000 feet or below)

8. Relight Using Windmilling Procedure
(See Page EP 1-6) ..... ACCOMPLISH

Maintain 240 KIAS until ready to initiate windmill start.

NO

(From 13,000 feet and below)

8. Relight Using APU Bleed Air Procedure
(See Page EP 1-8)) ..... ACCOMPLISH

Maintain between 190 KIAS (23,000 kg–51,000 pounds) and 170 KIAS (16,000 kg – 36,000 pounds).

— CONTINUED —

Double Engine Failure (Cont)

Relight usingAPU bleed air:

From 13,000 feet and below:

1. Target airspeed ..... REESTABLISH

AIRPLANE WEIGHT	TARGET BEST GLIDE SPEED
23,000 kg (51,000 lb)	190 KIAS
16,000 kg (36,000 lb)	170 KIAS

2. L and R 10TH STAGE BLEED ..... CLOSED
3. APU LCV ..... OPEN
4. CONT IGNITION ..... CHECK ON

Attempt to start one engine at a time:

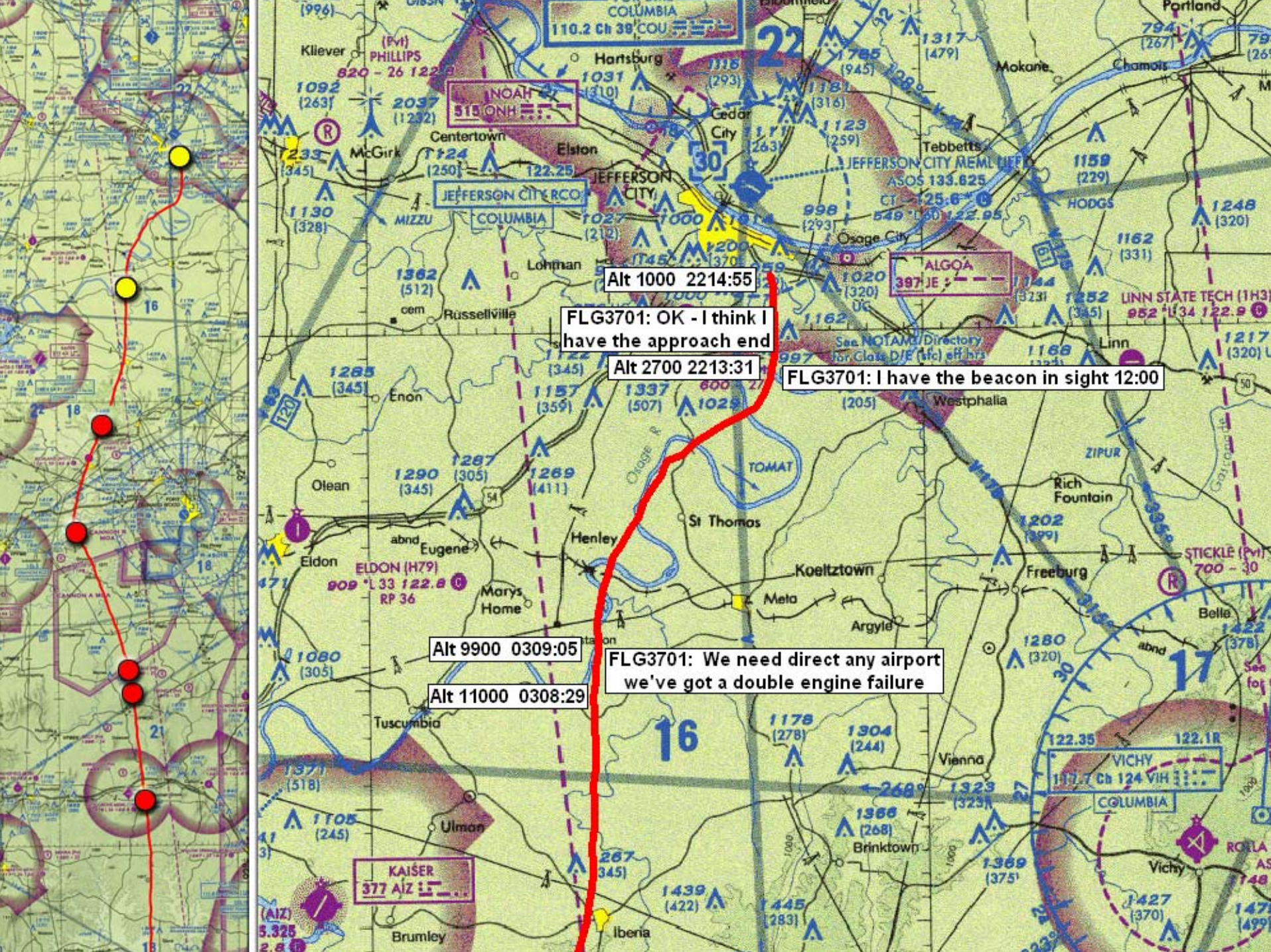
5. L or R ENG START ..... PUSH

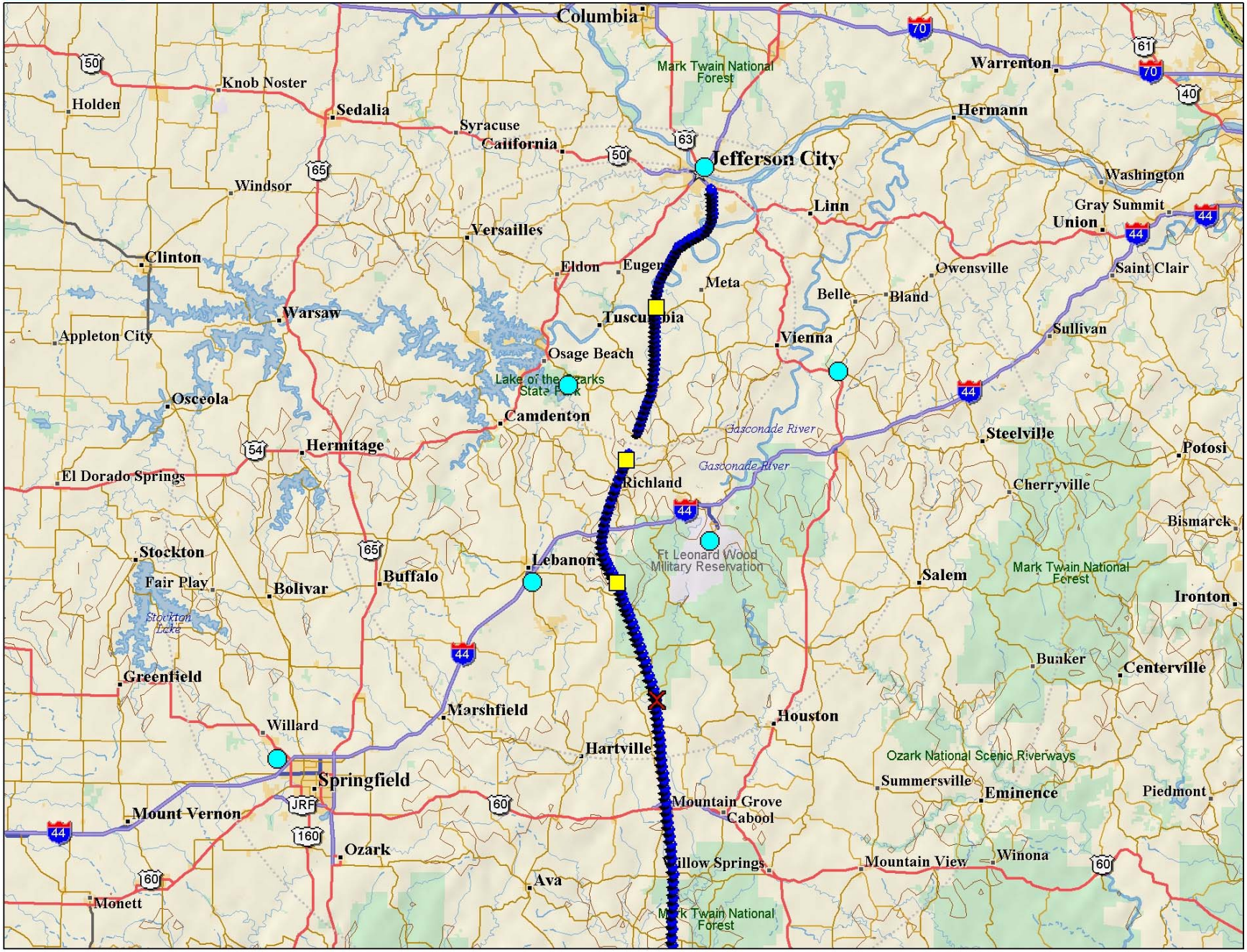
When N_2 is 28% or greater and ITT is 90°C or less:

6. Thrust Lever ..... IDLE
7. Engine Indications ..... MONITOR

Engine relights (within 25 seconds):

? — YES


Alt 1000 2214:55
FLG3701: OK - I think I have the approach end
Alt 2700 2213:31
FLG3701: I have the beacon in sight 12:00
Alt 9900 0309:05
FLG3701: We need direct any airport we've got a double engine failure
Alt 11000 0308:29
COLUMBIA
110.2 Ch 39 COU
NOAH
315 ONH
JEFFERSON CITY RCO
JEFFERSON CITY MEML ARPT
ASOS 133.625
ALGOA
397 JE
KAISER
377 AIZ
ELDON (H79)
VICHY
117.7 Ch 124 VIH
COLUMBIA
Kliever
Hartsburg
Centertown
McGirk
Elston
Cedar City
Tebbetts
Mokane
Chamois
Portland
Osage City
Lohman
Russellville
Linn
Westphalia
Enon
Olean
Eldon
Eugene
Henley
St Thomas
Rich Fountain
Koeltztown
Freeburg
Meta
Argyle
Marys Home
Tuscumbia
Vienna
Brinktown
Vichy
Ulman
Brumley
Iberia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Bismarck
Ironton
Centerville
Bunker
Houston
Salem
Mark Twain National Forest
Ozark National Scenic Riverways
Summersville
Eminence
Piedmont
Mountain View
Winona
Willow Springs
Mountain Grove
Cabool
Ozark
Ava
Springfield
Marshfield
Willard
Hartville
Lebanon
Ft Leonard Wood Military Reservation
Richland
Camdenton
Lake of the Ozarks State Park
Osage Beach
Vienna
Linn
Meta
Belle
Bland
Tuscumbia
Eldon
Eugene
Versailles
Windsor
Sedalia
Syracuse
California
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Clinton
Warsaw
Appleton City
Osceola
El Dorado Springs
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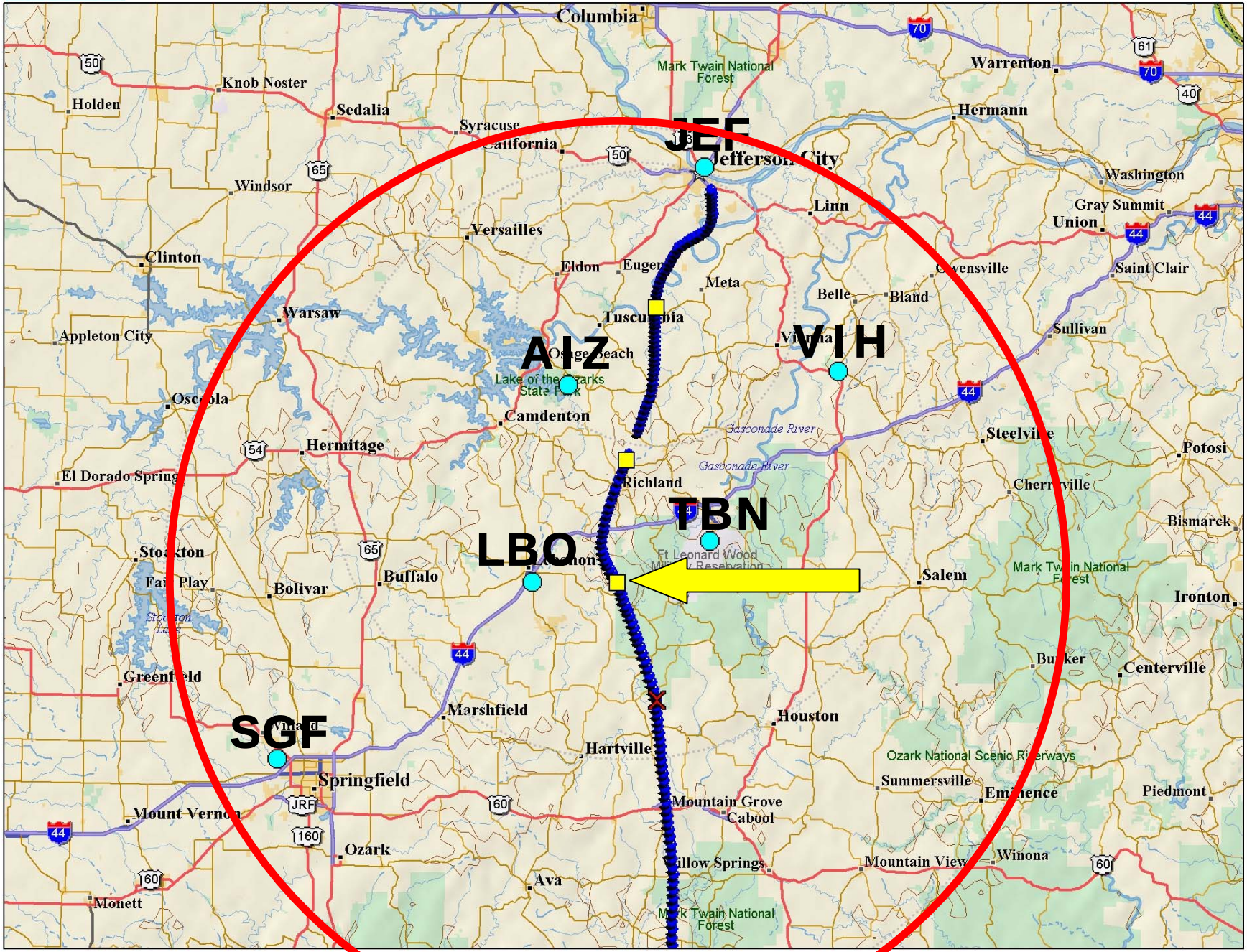
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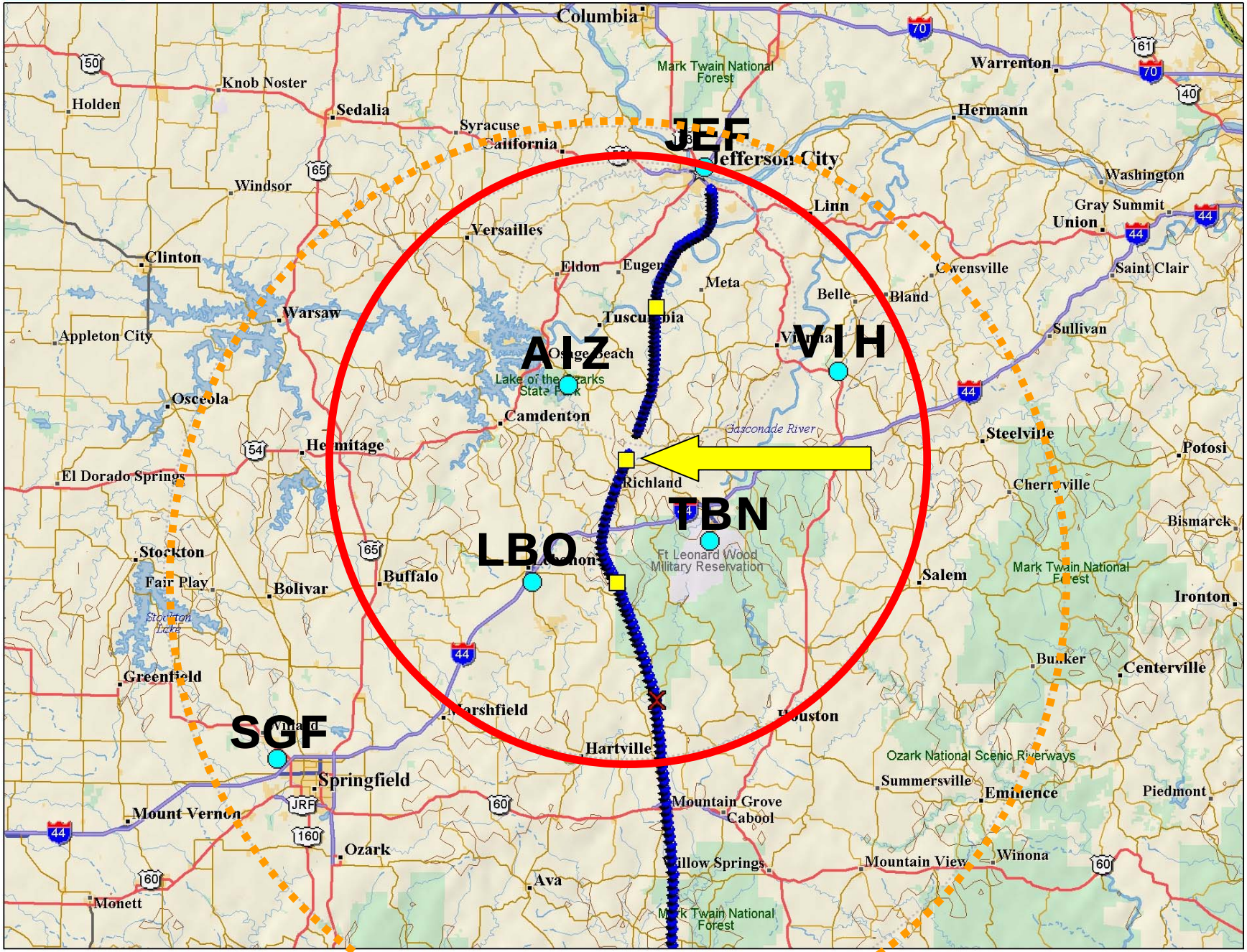
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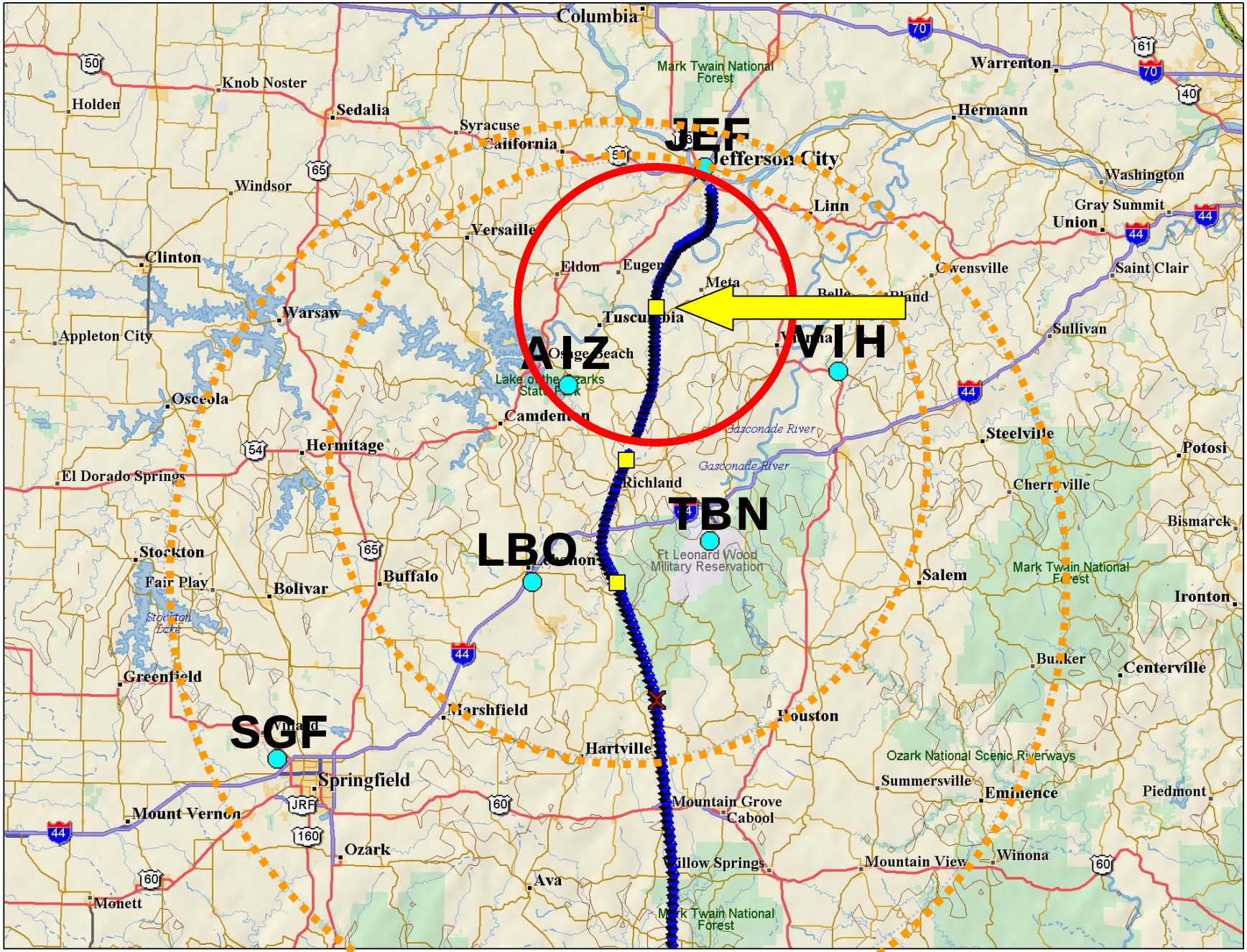
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- General Electric Engines
- Honeywell
- Hamilton Sundstrand
- Rockwell Collins

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